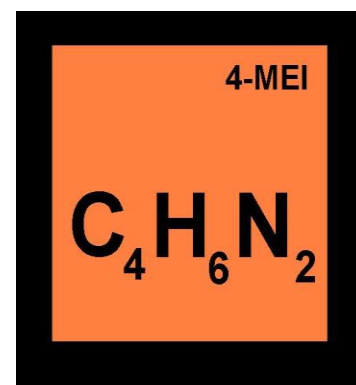


# 4-Methylimidazole

## (4-MEI)



### **What is 4-Methylimidazole (4-MEI)?**

4-Methylimidazole (4-MEI) is a compound used to make certain pharmaceuticals, photographic chemicals, dyes and pigments, cleaning and agricultural chemicals, and rubber products.

4-MEI is formed during the production of certain caramel coloring agents used in many food and drink products. It may also be formed during the cooking, roasting, or other processing of some foods and beverages.

### **How are most people exposed to 4-MEI?**

Most people are exposed to 4-MEI by consuming foods and beverages that contain it. Products that potentially contain 4-MEI include certain colas, beers, soy sauces, breads, coffee, and other products.

Workers may also be exposed to 4-MEI if they manufacture certain pharmaceuticals, dyes, and rubber, or if they work with ammoniated livestock feed.

### **What are the health effects of 4-MEI exposure?**

Studies published in 2007 by the federal government's National Toxicology Program showed that long-term exposure to 4-MEI resulted in increases in lung cancer in male and female mice. These findings were the basis for the addition of 4-MEI to California's Proposition 65 list of carcinogens.

Exposure to high concentrations of 4-MEI (such as concentrations that might occur in industrial settings) is reported to irritate the lungs or burn the eyes and skin.

### **How can I reduce my exposure to 4-MEI?**

Because less is known about exposure to 4-MEI than about exposure to many other chemicals, scientists will continue to study the ways people can be exposed to 4-MEI. The U.S. Food &

#### ***Fast Facts About 4-MEI...***

- 2011: Placed on the Proposition 65 list because the National Toxicology Program found 4-MEI caused lung tumors in laboratory animals.

What is Proposition 65? OEHHHA has provided some helpful information that explains how chemicals and substances end up on the list and how listing affects consumers and companies.

- [Click here for a "plain language" overview of Proposition 65](#)
- [Click here to skim "Frequently Asked Questions" about Proposition 65.](#)

Drug Administration – which regulates food and beverages – is currently assessing the cancer risk from 4-MEI.

Some caramel colorings used in some soft drinks and other beverages may contain significant amounts of 4-MEI. Cooking, roasting, or other food processing, such as the roasting of coffee beans, may also lead to formation of 4-MEI.

**What does it mean that 4-MEI appears on California’s Proposition 65 list?**

4-MEI is included on California’s Proposition 65 list of substances that can cause cancer. This means that businesses must provide a warning if they manufacture or sell products in California that cause exposures to significant amounts of 4-MEI. Additionally, significant levels of 4-MEI cannot be discharged into sources of drinking water.

OEHHA scientists have developed a “safe harbor” number for 4-MEI, which is a level of exposure that does not cause a significant cancer risk. Products that expose the public to levels of 4-MEI that are less than the safe harbor do not require warnings.

Businesses that do not provide a warning when required, or that discharge the chemical into sources of drinking water, risk civil lawsuits brought by state or local prosecutors or members of the public.